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# Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

1.	Your reference	RBT/P301899GB	02 OCT 2002
2.	Patent application number (The Patent Office will fill in this part)	0222759.3	
3.	Full name, address and postcode of the or of each applicant ( <i>underline all surnames</i> )	KH Technology Corporation Floor 2, Zephyr House Mary Street George Town Grand Cayman Cayman Islands British West Indies	
	Patents ADP number ( <i>if you know it</i> )		
	If the applicant is a corporate body, give the country/state of its incorporation	British West Indies	8086183001
4.	Title of the invention	MOISTURE CONTROL APPARATUS AND METHODS	
5.	Name of your agent ( <i>if you have one</i> )	W. P. Thompson & Co.	
	"Address for service" in the United Kingdom to which all correspondence should be sent ( <i>including the postcode</i> )	Eastcheap House, Central Approach Letchworth Herts SG6 3DS	
	Patents ADP number ( <i>if you know it</i> )	158003	✓
6.	If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and ( <i>if you know it</i> ) the or each application number	Country	Priority application number ( <i>if you know it</i> ) Date of filing ( <i>Day/month/year</i> )
7.	If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application	Date of filing ( <i>Day/month/year</i> )
8.	Is a statement of inventorship and of right to grant of a patent required in support of this request? ( <i>Answer 'yes' if:</i> a) any applicant named in part 3 is not an inventor, or b) there is an inventor who is not named as an applicant, or c) any named applicant is a corporate body. See note (d))	Yes	

## Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description	4
Claims	2
Abstract	
Drawing(s)	1 + 1

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10. If you are also filing any of the following, state how many against each item.

Priority documents

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Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*) 1

Request for substantive examination (*Patents Form 10/77*)

Any other documents  
(Please specify)

11. We request the grant of a patent on the basis of this application

Signature W. P. Thompson & Co. Date September 30, 2002

W. P. Thompson & Co.

12. Name and daytime telephone number of person to contact in the United Kingdom Roger B Thomson  
01462 682139

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# MOISTURE CONTROL APPARATUS AND METHODS

This invention relates to apparatus for and methods of controlling moisture in an enclosure, and is particularly, 5 but not exclusively, concerned with controlling the moisture in the enclosure or cabinet of an electroacoustic apparatus such as a loudspeaker.

It has long been known that the acoustic characteristics of a loudspeaker are affected by the relative humidity in the 10 cabinet. For example, in GB2146871 methods are described of using a moisture barrier to prevent moisture from entering the enclosure of a loudspeaker:

In International patent application PCT/GB2002/003432 there is described the use of adsorbent material, within a 15 loudspeaker cabinet, which is at least partially hydrophobic, to repel moisture and increase the acoustic compliance of the acoustic enclosure. However, the effectiveness of this is dependent inter alia on the relative humidity of the air or gas within the enclosure, i.e. the amount of moisture 20 present.

It is an object of the present invention to control the moisture within an enclosure which constitutes a humidity sensitive region. This includes, but is not limited to, loudspeaker enclosures.

25 It is another object of the present invention to provide means for and methods of reducing the moisture within an enclosure which constitutes a humidity sensitive region, such as a loudspeaker cabinet.

Broadly in accordance with the invention this is

achieved by providing a heat source in or in communication with the enclosure and arranging that air or gas within the enclosure, when the heat source is operative, will pass out of the enclosure and entrain moisture therewith.

5       The system functions essentially as a pump to remove moisture from the enclosure.

Preferably, the heat source is switched on and off cyclically. In the case of a loudspeaker enclosure, into which moisture from the ambient atmosphere enters slowly, it  
10       may be necessary to switch the heat source "on" only every 3 to 4 hours for example.

The heat source can be of any suitable form. For example, one or more electrical resistors may be used, with an associated switching circuit.

15       In order that the invention may be more fully understood, an embodiment in accordance with the invention will now be described by way of example and with reference to the accompanying drawing which is a schematic diagram of a moisture controlled enclosure in accordance with the  
20       invention.

Referring to the drawing, there is shown an enclosure 10 which constitutes a humidity sensitive region and which contains air and/or gas or gases. In the case where the enclosure 10 is a loudspeaker cabinet, loudspeaker units  
25       and/or other electroacoustic devices 11 will be present in the enclosure. In such a case, the ambient air will gradually leak into the enclosure, for example via the loudspeakers, and if the relative humidity of the ambient air is high, then the moisture content within the enclosure will

increase, adversely affecting the acoustic characteristics.

A tube 12 with a bore which is narrow enough to prevent the diffusion of gases therethrough in a steady-state condition is in communication with the enclosure 10.

5 Although the tube 12 is shown as being external to the enclosure, it could alternatively be positioned physically within the enclosure, or partially within the enclosure. Part way along the length of the tube 12 is a zone 14 which holds a dessicant 16. Again, regardless of the location of  
10 the tube 12, the dessicant 16 could alternatively be located within the enclosure. As shown, the tube 12 acts as a moisture trap.

At least one heat source, for example, a resistive circuit, is provided to heat the air/gas/water vapour in the  
15 enclosure 10 or in the passage/zone 14 which is in communication with the enclosure.

The heat source could be provided in the enclosure, as indicated at 18A, or at the dessicant 16, as indicated at 18B. Alternatively, more than one heat source could be  
20 provided, for example one in the enclosure and one in the moisture trap. Under most circumstances the moisture can be adequately controlled by a cyclic operation of the heat source, for example at intervals of a few hours, e.g. 3 to 4 hours. This is suitably controlled automatically, by the use  
25 of a switching circuit 19. The heat generated by the heat source or sources will cause an expansion of the gases within the enclosure and there will be a passage of gases outwardly from the enclosure via the tube 12, entraining water vapour.

Although the invention has been described with particular reference to loudspeakers, it is to be understood that it is applicable to any enclosure which constitutes a humidity sensitive region and where one wishes to control the  
5 moisture within that enclosure.

## CLAIMS:

1. An enclosure which constitutes a humidity sensitive region and whose moisture content is arranged to be reduced by providing within the enclosure and/or in gaseous communication therewith a heat source, the enclosure comprising passage means to enable the outward movement of gases therefrom when the heat source is operative.
2. An enclosure as claimed in claim 1, in which the heat source comprises one or more electrical resistors.
3. An enclosure as claimed in claim 1 or 2, in which the heat source is cyclically operative.
4. An enclosure as claimed in claim 1, 2 or 3, in which the heat source is cycled at intervals of hours.
5. An enclosure as claimed in any preceding claim, in which the passage means comprises a tube having a bore narrow enough to prevent diffusion of gases therethrough.
6. An enclosure as claimed in any preceding claim, which includes a dessicant.
7. An enclosure as claimed in any preceding claim, which is a loudspeaker enclosure.
8. A loudspeaker enclosure as claimed in claim 7, in which the enclosure includes an adsorbent material which is or which has been treated to make it at least partially hydrophobic.
9. A method of controlling the moisture in an enclosure which constitutes a humidity sensitive region, which comprises heating the gases within the enclosure or in gaseous communication therewith by a heat source, and providing for the outward movement of gases from the

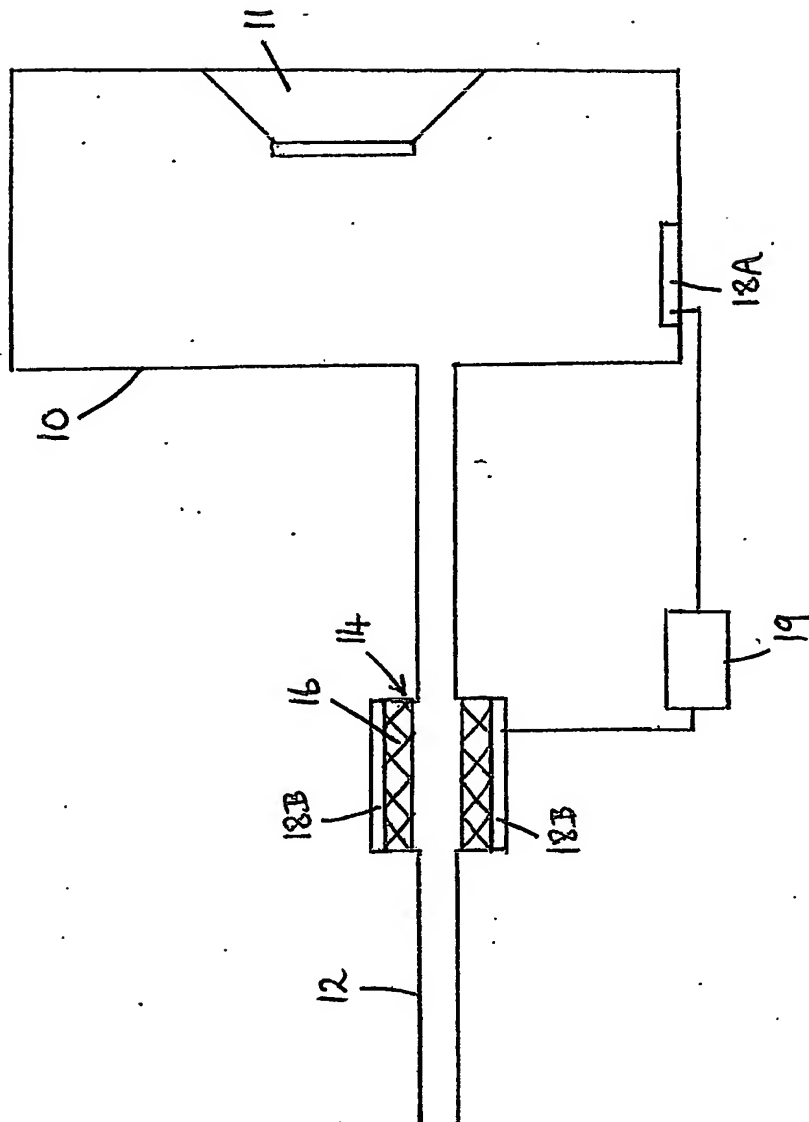


enclosure when the heat source is operative.

10. A method as claimed in claim 9, in which the enclosure is a loudspeaker enclosure.

11. A method as claimed in claim 9 or 10, in which the  
.5 heat source is cyclically operative.

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PCT Application  
**GB0304276**



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